DOCUMENT RESUME

ED 226 454 EA 015 382

AUTHOR	Hall, Gene E.; Loucks, Susan F.
TITLE	The Concept of Innovation Configurations: An Approach to Addressing Program Adaptation. Research on Concerns-Based Adoption.
INSTITUTION	Texas Univ., Austin. Research and Development Center for Teacher Education.
SPONS AGENCY	National Inst. of Education (ED), Washington, DC.
REPORT NO	R&D-3116
PUB DATE	13 Apr 81
NOTE	32p.; Presented at a symposium, "Assessing Program Adaptation during Implementing: Concepts, strategies, and Issues," at the Annual Meeting of the American Educational Research Association (Los Angeles, CA, April 13-17, 1981). For related documents, see EA 015 383-384.
AVAILABLE FROM	Communications Services, Research and Development Center for Teacher Education, Education Annex 3.203, University of Texas, Austin, TX 78712-1288 ($2.00).
PUB TYPE	Speeches/Conference Papers (150) -- Viewpoints (120) -- Reports - Research/Technical (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Educational Change; Educational Innovation; Educational Research; Program Evaluation; *Program Implementation; *Research Problems
IDENTIFIERS	*Innovation Configurations

ABSTRACT

Researchers have only recently recognized that assertions by various educators that they have implemented educational innovations do not all mean the same thing or bear the same weight, according to the authors of this report. Efforts made by the Research and Development Center for Teacher Education at the University of Texas at Austin to formalize research on the implementation of innovations led to the development of two measurement concepts. The first of these, used when assessing the degree to which innovations have been implemented, is called levels of use of the innovation; the second, establishing a perspective from which to define an implemented innovation's operational form, is called innovation configurations. This report discusses several alternative perspectives from which implementation can be viewed, then details the characteristics of the innovation configurations approach. Several conceptual, methodological, and practical issues emerging from this way of defining the status of innovations are explored in the report's final section. (Author/PGD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

O. Bown

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED226454

RESEARCH ON CONCERNS-BASED ADOPTION

THE CONCEPT OF INNOVATION CONFIGURATIONS: AN APPROACH TO ADDRESSING PROGRAM ADAPTATION

Gene E. Hall

Susan F. Loucks

R&DCTE

Research & Development Center for Teacher Education

The University of Texas at Austin

EA 015 382

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

O. Bown

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

THE CONCEPT OF INNOVATION CONFIGURATIONS: AN APPROACH TO ADDRESSING PROGRAM ADAPTATION

Gene E. Hall

Susan F. Loucks

Research and Development Center for Teacher Education
The University of Texas at Austin

R & D Report No. 3116

Paper presented at the annual meeting of the
American Educational Research Association,
Los Angeles, April 13, 1981

EA 015 382

THE CONCEPT OF INNOVATION CONFIGURATIONS: AN APPROACH TO ADDRESSING PROGRAM ADAPTATION[1,2]

Gene E. Hall

Susan F. Loucks

Research and Development Center for Teacher Education
The University of Texas at Austin

During the last five years change process researchers have focused in on the implementation phase. There has been a concentrated effort to develop dimensions and conceptual frameworks that will help in understanding and describing change process dynamics as they unfold during this important phase. Implications of this research bear directly upon issues that confront evaluators, researchers in other fields and practicing change facilitators.

Until quite recently implementation of an innovation, a new program or procedure, was assumed to have taken place if an administrator, or in some cases the supposed user, stated that the innovation was in use. In the 1960's there were attempts to develop "teacher proof" innovations, which would automatically be implemented upon delivery without local site modification. Recently, in contrast, there has been a great deal of attention paid to the concept of "mutual adaptation," where the innovation is adapted by and for each user. The concept of "fidelity" has been an issue all along. Yet, clear resolution of implementation related conceptual and methodological problems has not yet been achieved for researchers, evaluators or practitioners.

---

[1]The research described herein was conducted under contract with the National Institute of Education. The opinions expressed are those of the authors and do not necessarily reflect the position or policy of the National Institute of Education. No endorsement by the National Institute of Education should be inferred.

[2]Paper presented at the annual meeting of the American Educational Research Association, April 1981, Los Angeles.

As a part of research on the change process using the Concerns-Based Adoption Model, staff at the Texas R&D Center have been grappling with implementation issues. The mission of the research project is development of concepts that will help in furthering understanding of the change process and contribute to more effective research, evaluation and change facilitation efforts.

A very early issue in this research was determining if various supposed innovation users were in fact using the program or process (i.e., the innovation) that was under consideration. Field staff quickly observed that the testimony of administrators and even supposed users was not necessarily a valid indicator of how much of a particular innovation was in fact being used. There was a pressing need for a framework, procedures and criteria to use in determining when the innovation was actually in use. After much discussion, field experience and exploration it became clear that two basic questions needed to be asked of each subject.

1. Is it, the innovation, being used?
2. What is "it"?

Although these two questions seem obvious in hindsight, their initial specification and the determination of how to collect information to answer them was not as straight-forward as might appear.

Is It Being Used?

In Texas Center research, the first question was addressed through the concept of Levels of Use of the Innovation (Hall, Loucks, Rutherford & Newlove, 1975). The question "Is it being used?" implies that use is a dichotomous variable, that either a person is or is not using the innovation. However, our research suggested that the answer was more complex, and from that complexity

eight different Levels of Use were derived. This concept distinguishes between three different levels of nonuse and five different user levels. The Levels of Use describe in operational terms how users change their behavior with the innovation as they move from no innovation related behavior, to early mechanical use and to later more sophisticated use. The concept also takes into account the kinds of adaptions or changes a user makes in use of the innovation or in the innovation itself.

The Levels of Use concept has several implications for evaluation personnel, researchers and change facilitators. Contrary to what was frequently assumed in the past, the claims of administrators and, in many cases, even teachers about use of an innovation are often inaccurate. In one study, for example, it was found that only 80 percent of the teachers in a treatment group were in fact using the innovation; twenty percent were not. In the so-called "comparison group," 49 percent of the sample were using the innovation (Hall & Loucks, 1977). This leads to the phenomenon that Charters and Jones (1973) have referred to as the evaluation of "non-events". All too frequently it appears that researchers as well as evaluators have simply assumed the existence of a treatment group and a comparison group when in fact all the users were not in one group and nonusers in the other group. At this point it seems clear that the question "Is it being used?" does need to be addressed in research and evaluation efforts. The concept of Levels of Use is one demonstrated way to address this question.

What Is It?

The second question, "What is it?" is more problematic. This question again has been addressed in the literature from various orientations. The answer to "What is it?" seems to vary depending upon the orientation that is

used to address the question. This compounds the problem for researchers, evaluators, and change facilitators alike who must know the innovation when they see it. Defining what it is is not a simple task.

In the next section of this paper some of the alternate perspectives that have been used to define "it," the innovation, are explored. In a later section our emphasis, describing the innovation in terms of its operational form, will be explored. We have coined the term, Innovation Configurations, to represent this orientation. The final section of the paper is used to explore several conceptual, methodological and practical issues that emerge from this way of defining the innovation.

Which Orientation?

Very different orientations have been used to define innovations in the literature. The variables that are assessed to determine implementation and treatment effects can vary considerably depending on the orientation that is selected. Further, the use/nonuse question is compounded by the orientation that is taken for defining the innovation. The following briefly describes some of the different orientations that have been used to describe innovative programs, procedures and practices. Note that each orientation for defining the innovation requires assessment of different variables and attributes and in some cases different subjects would be assessed.

Perceived Attributes

One of the best known orientations for defining the innovation is that developed by Rogers & Shoemaker (1971). They describe the innovation in terms of how it is perceived by prospective adopters. They propose five attributes of innovations: (1) relative advantage, (2) compatibility, (3) complexity, (4)

trialability, and (5) observability. With this orientation it does not matter in an absolute sense, what the innovation actually is, but rather how it is perceived by potential users. Thus, those innovations that appear to have a relative advantage, to be compatible with present practices, not too complex, easy to try out and yield results that are easily observed, are more likely to be adopted. From a diffusion or communication of innovations point of view this way of addressing the characteristics of an innovation makes good sense. For those who are interested in implementation, however, this orientation is not of much assistance since it does not provide information about the innovation itself and what use actually entails.

Philosophy

Many innovative programs and practices are described in terms of their philosophical orientation, the values, underlying assumptions and beliefs that are associated with the innovation. From this orientation the innovation is described in terms of the fundamental beliefs of the innovation developers. This orientation for defining an innovation is particularly useful at the initial selling phase, since the innovation can be assessed in terms of how closely it fits or competes with the value positions of potential adopters. Again, for evaluators, researchers and change facilitators who are concerned about implementation, having merely a description of the philosophy of an innovation does not help in assessing whether or not it is in use. There is apt to be a large gulf, if not an absolute lack of correlation between espoused philosophy and actual practice.

Goals and Outcomes

More recently, innovations have been described in terms of their goals and outcomes. With this orientation, the overall goals of an innovation are empha-

sized, frequently in broad-sweeping terms. In many cases more specific objectives and promised effects of the innovation are also highlighted. Due to the push for "validation" of programs and strong emphasis upon the identification and specification of outcomes that can be associated with an innovation this orientation seems to be of increasing importance. From an implementation perspective, this orientation also does not make clear exactly how the innovation was used to achieve the outcomes that are associated with it.

Implementation Requirements

Another common way of describing an innovation is in terms of its implementation requirements. This is an orientation in which potential adopters are naturally interested. Those concerned about high fidelity implementations also place special emphasis upon the description of implementation requirements. Thus, an innovation is described in terms of those steps, procedures and resources that are needed in order for it to be adopted. With this orientation an innovation description may include the required classroom space, the permitted teacher/student ratio, the name of the textbook and tests and special inservice sessions that must be attended. The concern from an implementation perspective is once again, having taken all of the steps to address implementation requirements does not indicate if or how the innovation is being used. Requiring the presence of five microscopes indicates nothing about how those microscopes are to be used when the innovation is in operation.

Functions

Another orientation advanced by Treadway (1980), is description of an innovation in terms of its functions. The question becomes, "Are the various functions of the innovation being carried out?" If so, then one can say that the innovation is in place. From a conceptual point of view, this orientation has a

great deal of appeal. Operationally however, it appears to require a great deal of skill and effort to identify and describe the various functions. Further, it is conceivable that the unique properties of a particular innovation could be lost in the description of more generic functions. Determining those features that are exclusively part of the specific innovation under consideration could be quite difficult. At a more global level, this is not an issue. However, if one is concerned about implementation of a specific innovation in a specific context, then maintaining the innovation's identity within the functional analysis may become problematic.

Behaviors

For change facilitators, evaluators and researchers none of these orientations focus on identification and description of the actual treatment that each program user delivers. This is the problem that was encountered in the early Levels of Use research. Just because teachers or professors have taken the training, have the materials in the classroom, are able to espouse the philosophy of the innovation and have "adopted" it from the point of view of perceived attributes, does not tell what they are doing. In fact what might be observed in one classroom could be inconsistent with what was observed in another classroom. The configurations of the innovation would vary yet all could be "users" of the innovation in name.

Knowing what is actually being used in the name of a particular innovation is important for a number of reasons. Fullan and [illegible]et (1977) mention four:

(1) to be clear about exactly what has changed as a result of an innovation effort,

(2) to understand some of the reasons why so many educational changes fail to become established,

(3) to avoid ignoring the important phase of implementation, and

(4) to allow interpretation of learning outcomes and relating these to possible determinants.

In order to understand the complex process of change, its outcomes and its determinants, it is clearly necessary to monitor the changes in practice that are actually occurring.

Measuring Implementation

The issue of how to measure what is actually being implemented has been given much thought in recent years, especially in terms of describing behaviors (Leinhardt, 1980). In their evaluation studies of Follow Through Models, Stallings and Kaskowitz (1974) were among the first to establish a set of procedures to verify that an innovation was actually in use before collecting evaluation study data. In their study, innovation developers were surveyed for descriptions of what the innovation should look like in use. The presence of these characteristics in study classrooms was then documented.

Evans and Scheffler (1974) also concentrated on the innovation and how it was being implemented when they evaluated the Individually Prescribed Instruction (IPI) mathematics program. In their work they attempted to assess which of eleven developer-identified innovation categories were in use at each study school. They discovered that not only did the degree of implementation of the innovation (i.e., the number of categories observed) vary among schools, but that there were even differences in the categories.

The problems of how to measure the degree of implementation of an innovation are just beginning to be understood. Gephart (1976) has identified several classes of measurement problems and more recently Owens and Haenn (1977) have developed a clear summary of difficulties. The latter authors also provide

illustrations of how they have handled the problems in their evaluation of Experience-Based Career Education (EBCE).

Work done at the Texas R&D Center in elementary schools, where the focus was on studying implementation of various educational innovations, clearly documented the need to better understand what users were actually doing with an innovation, as well as to explore procedures to assess their varied use. For example, in one study Center staff found many teachers who said they were teaming, but their descriptions indicated wide variation. One team might consist of two teachers who met once a month to share lesson plans, and kept their own classes intact through the school year. Another team would have 4 teachers, with time every Thursday afternoon for teacher planning, and students constantly revolving from teacher to teacher for different subject matter areas. Both sets of teachers were "teamers." Yet, the configurations of teaming that they were using were extremely different. This led to the proposal of another orientation for defining the innovation, that of Innovation Configurations, (Hall & Loucks, 1978).

The Concept of Innovation Configurations

The emphasis of Innovation Configurations is upon describing the operational form of the innovation as it is being used by each person. This includes the actual behaviors and roles of the people, teachers and students, how materials are used, how special procedures are performed and what the interactive strategies, relationships and processes are.

For any innovation, major components can be identified. For example, the components of an individualized program in mathematics might include (1) how materials are used, (2) how the students are grouped, (3) how students are tested, and (4) what is done with test results. Or a procedure such as the

direct instruction model which has been developed by classroom researchers could be described in terms of such components as (1) academic content coverage, (2) student engagement, (3) role of the teacher, (4) grouping, and (5) management procedures.

For each component, variations in how that component can be used are identified. For example, for each of the innovations identified above grouping of students is a component. Variations on the grouping component could include (a) one large heterogeneous group, (b) one large homogeneous group, (c) several small groups, or (d) individualization. Variations for other components can also be identified (See Figure 1).

Figure 1

Innovation Components and Variations

Component 1: Grouping

Variation 1: One heterogeneous group
Variation 2: One homogeneous group
Variation 3: Several small groups
Variation 4: Individualized

Component 2: Materials Usage

Variation 1: Uses textbook only
Variation 2: Uses program materials only
Variation 3: Uses a combination of materials

Across classrooms within a particular building, across a particular school district, and clearly across different sites in different school districts, there is likely to be considerable variation in how each component is actually implemented by each user. Thus, in terms of the component, grouping of students, the innovation could vary in significant ways. Yet, all teachers should be "users" of the innovation.

The challenge for the researcher, evaluator, or change facilitator is first to determine which components of the innovation are in fact being used and secondly, to determine which variations of each component are in use. Components usually represent descriptions of the materials, role and style of the users as they are interacting with the processes and procedures of the innovation. Once information about these components is documented then other questions might be addressed. Why are certain component variations observed and others not? What outcomes are associated with the innovation and which are not? Why and how users adapt innovations in particular circumstances and contexts can be addressed.

Assessing Innovation Configurations

The key to identifying Innovation Configurations is to first determine the components and the component variations that describe the innovation in use. The degree of specificity and the complexity needed is best determined by considering the use to be made of the resultant information. An innovation developer may emphasize ten components while the practitioner may consolidate these into three or four. Further, the innovation developer may, and often does, tolerate less variation in each component than does the practitioner.

For Texas R&D Center research a basic procedure has been developed for identifying the components and component variations of each innovation to be considered (Heck, Stiegelbauer, Hall & Loucks, 1981). The first step entails review of the materials that are available that describe and constitute the innovation. Then, if it is possible, the developer or another individual who represents expertise in use of the innovation is interviewed. Following this a sample of users representing a range in use of the innovation are observed and interviewed.

Throughout this process the major components of the innovation and how each of these components can vary are being identified. These are summarized in an Innovation Configuration Checklist. Information to complete a checklist may be collected through procedures such as observation, interview and questionnaire. For a particular subject the combination of component variations that are checked on the checklist represents the configuration of the innovation that that particular person is presently using. A sample checklist appears in Figure 2.

One important point worth reemphasizing is that the Innovation Configuration Checklist is distinct and different from tne collection of data to complete the checklist. The checklist is a synthesis and record of the findings. Gathering the information to complete the checklist on each user is a separate step. Also, determining why particular component variations and configurations are in use and others are not is a separate question from determining what the configurations are.

Issues and Implications of Innovation Configurations

The Innovation Configuration perspective for describing what the innovation is has been highlighted briefly. In this approach the emphasis is placed upon identifying and describing the various operational forms of an innovation as implemented by users. This orientation is particularly important for those conducting research and evaluation studies and is also important for change facilitators, who have the role of encouraging implementation of various innovations. Without innovation configuration information it is all too easy to make inaccurate inferences about how the innovation is being used. This can greatly endanger potential studies because of inaccurate interpretation of study results; it can also lead to change facilitators designing and delivering staff

Figure 2
Tutoring Program Checklist

1. Materials and Equipment	(1)	(2)	(3)
	At least 5 different program materials are used with each child each session.	At least 3 different program materials are used with each child each session.	Less than 3 different program materials are used with each child each session.
2. Diagnosis	(1)	(2)	(3)
	Children are diagnosed individually using a combination of tests and teacher judgment.	Children are diagnosed individually using teacher judgment only.	Children are not diagnosed individually.
3. Record-Keeping	(1)	(2)	
	Individual Record Sheet is used to record diagnosis and prescription.	No Individual Record Sheets are used.	
4. Use of Teaching Technique	(1)	(2)	
	Continually readjusts task according to child needs; uses rewards to reinforce student success.	Does not continually readjust task according to child needs; does not use rewards.	
5. Grouping	(1)	(2)	
	Children are taught in pairs.	Children are not taught in pairs.	
6. Scheduling	(1)	(2)	(3)
	Children are taught for 30 minutes 3 times per week. Each session is equally divided between children.	Children taught for 30 min. 3 times per week, time for each child and each task varies slightly when necessary.	Children not taught for 30 min. per week 3 times per week, or time for each child and each task varies markedly or is not considered.

CODE: ——— Variations to the right are unacceptable; variations to the left are acceptable.

— — Variations to the left are ideal, as prescribed by the developer.

development experiences or other interventions that are not congruent with the needs and present practices of their clients.

In the remainder of this paper, as well as the other papers that are a part of this symposium (Heck, 1981; Melle & Pratt, 1981; Trohoski, 1981) some of the issues that are raised by looking at innovations from this perspective are explored. Each of these issues represents an area where there has been interesting and extended dialogue and debate. In some instances the Texas R&D Center staff have developed some fairly definite direction and opinions. With other issues their continue to be "friendly and frank discussions." We invite others to join in this exploration and discussion. All who are concerned with the change process have to face these questions and problems and develop explicit or implicit answers. First, some of the conceptual issues that have arisen, are discussed, then some research and evaluation issues and finally some implications for change facilitators.

Conceptual Issues

Although product or material-based innovations are typically used for illustration purposes, the concept of Innovation Configurations can be applied to all types of innovations. The concept applies equally well to process innovations, non-classroom innovations, non instructional innovations and group use and organizational innovations. In all cases, the essential questions are the same: "What does the innovation look like in operation?" and "What are the major components and component variations that can be observed or that must be considered?" Regardless of the situation there are some interesting conceptual questions that arise out of this orientation.

1. Are all components of equal importance?

Clearly, with any innovation, all innovation components are not of equal importance. One useful way to consider these has been to identify critical components and related components. The critical components are those that must be in place in order for the innovation to be considered in operation. The related components are those that represent embellishments. They may contribute to the overall robustness of the innovation or lead to additional effects that are nice to have but are not necessary for basic use of the innovation.

Interestingly, this relates to Treadway's (1980) work on the functions of innovations. Extrapolating from what Treadway has said, it seems conceivable that certain different Innovation Configuration components or component variations could be "functionally equivalent". It is conceivable that certain component variations may have the same effects as others. Such situations are in part what lead Treadway to advocate that evaluators need to assess functions rather than to require that particular components be in place.

However, this clearly adds another dimension to the evaluator's role. Before a particular component or component variation can be judged as equivalent to another component or component variation someone must answer the equivalence question. Thus, the evaluator would have to run tests of equivalence across various component variations, before each could be judged as equivalent.

By using the concept of Innovation Configurations this question can be avoided. the results of the initial summative evaluations of the innovation or some agent's judgement can provide the basis for determining what operational components are associated with the desired outcomes. Clearly, this too is problematic. However, the encouraging note is that between work at the Texas Center and that of Treadway, the question can be explored both conceptually and empirically.

2. Whose perspective is used to define the components?

One of the basic questions that has to be addressed in any study is the point of view used to determine the components and component variations of a particular innovation. Depending upon the source that is selected, not only is it likely that the terminology used will be different, but also it is quite conceivable that very different components will be identified. For example in one Texas R&D Center study the developer of the innovation placed strong emphasis upon the components of "use of tests" and "teaching to the objectives," while teachers focused upon the record keeping system and the grouping of children. The development of Innovation Configuration components, component variations and the composite checklist must take into account the perspective that is going to be used to make these specifications. The optimal situation would be a consensus in terminology across change facilitators, developers, users, and evaluators. However, this is not always possible. Consensus, or lack of it in a particular case, is more a consequence of management of the change process than it is an inherent dilemma within the concept of Innovation Configurations.

3. How do you handle adaptation?

Regardless of the perspective that is taken there will be a point where the component variations are so changed that they move outside of the realm of what one would classify as innovation-related behavior. This point of drastic mutation is an important one for evaluators, researchers and change facilitators to identify. It becomes important in specifying the use/nonuse decision point which is so crucial to determining the existence of treatment and control groups. It is also important to the design of staff development and other interventions to support use of the innovation. If certain component variations can be identified as beyond the point of drastic mutation, that is outside the realm of acceptable use of this innovation, then all parties can be aware of this and appropriate actions can be taken.

Note on the Innovation Configuration Checklist in Figure 2 that some component variations, those to the left of the solid line, have been identified as acceptable. Tose to the left of the dotted line represent ideal variations. This kind of indication is useful if the checklist is to help answer questions such as: is the innovation being used in an acceptable configuration?

One of the interesting aspects of the point of drastic mutation is that rather than this being a point, as soon as multiple sources are checked it frequently becomes an area of drastic mutation. In many cases, there is not consensus about which component variations are acceptable and unacceptable practice. Clarification of this issue alone could greatly facilitate change efforts and studies that are being done of them.

4. When and how does one determine fidelity of implementation?

The identification of Innovation Configuration components and component variations might imply to some a fidelity perspective, since the emphasis is upon describing what use of the innovation actually entails. However, it is possible to be purely descriptive by simply describing each variation and not distinguishing ideal and acceptable variations. Again, whether or not this is done depends on the use to which the data are to be put, and the evaluation or research questions to be answered.

On the other hand, the concept of Innovation Configurations can also help us operationalize the notion of fidelity. Basically, fidelity could be defined as replication of the essential components of the innovation. However, this does not determine the range of variations of each component that will be accepted. It is conceivable that in one case fidelity may include a large range of variations of each component while in another instance, fidelity may by definition be restricted to one set of configuration variations. How closely fidelity must fit the developer's ideal model is one that has to be determined for

each particular setting. With some developers a large number of configurations are encouraged, while with other developers only one or two configurations are considered acceptable. In other instances very sophisticated configurations may in fact represent nonuse of the innovation.

Fidelity then becomes a judgement call made by one or more sources. The judgement may be made by the developer, it may be made by the change facilitator, or it may be left to the evaluator. In other instances users determine individually what fidelity means. The point that has emerged from work with the Innovation Configuration concept is that this question needs to be answered for each study. If it is not answered explicitly, it will be implicitly.

5. Are there generic components that cut across innovations?

Logically it would seem that for various types of innovations some of the same components would be identified. These "generic" components might be applicable to most innovations. Having a list of these would aid evaluators, researchers and change facilitators in identifying the components of their particular innovations. Fullan and Pomfret (1977) have proposed one set of components that might be a start in this direction. These are: materials, structure, role/behavior, knowledge and understanding. Leithwood and Montgomery (1980) have also given a great deal of thought to this in terms of possible components of curriculum innovations. In a study which identified components for 45 different innovations, (The NETWORK, 1981) components in the following categories were identified repeatedly:

Materials
Content
Prescriptive Activities
Teacher/Student Interactions
Affective Strategies
Instructional Activities
Student Activities
Record Keeping
Grouping
Sequencing/Pacing
Scheduling
Coordination
Testing
Ongoing Assessment
Screening
Program Evaluation

At this time there are not a clear set of generic components, especially across various classes of innovations. However, in theory it is pleasing to think that there probably are basic components that could be identified and used to help structure the description of specific innovations. If generic components could be identified this would simplify the problem of cross-innovation comparisons.

6. How do configurations evolve?

The assessment of the Innovation Configuration of each user is a time-dependent phenomenon. Innovation configurations represent a snapshot of user practice. It appears from the studies done to date that there is an evolution to the configurations that a teacher uses over time. In fact it appears from a couple of analyses that early users are more apt to use particular configurations of an innovation and persons with more experience with an innovation can be associated with other configurations, while some configurations can be found across the experience range.

Clearly, contextual factors and change facilitator interventions are likely to affect which configurations are present at a point in time. If implementation is to be understood through research and evaluation studies, longitudinal designs are a must.

7. What about the size of an innovation?

Another interesting dilemma is attempting to develop means for comparing different innovations. How can study findings and implications of change efforts be contrasted across several innovations? One promising concept at this point is that of size. Innovations come in different sizes. The dimensions of size may include variables such as the number of components, the amount of trauma that implementation entails, the amount of resources and energy that is consumed in implementation, how large a part of the user's life space is affect-

ed, and the amount of change from past practice that the innovation represents. The concept of size makes a great deal of sense to practitioners who must make decisions among various innovations and care about their potential influence on the total teaching/learning environment. Although the definition of size is not operational at this time, Texas R&D Center staff were able to reliably rank order 16 different innovations for which Innovation Configuration data had been collected. That rank ordering was done in terms of their relative size. As the use of innovations is analyzed more closely, perhaps the number of components can be used to indicate size, or perhaps a system of weighting components will be developed to help in determining how much change is being attempted.

8. When is an innovation an innovation bundle?

One of the other concepts that has been useful is to distinguish between a single innovation and a bundle of innovations. All too frequently evaluators, change facilitators, administrators and policy makers refer to a particular program as a discrete innovation when in fact it is a bundle of innovations. Programs such as Individually Guided Education (IGE) and Competency-Based Teacher Education (CBTE) are innovation bundles, composites of specific innovations such as teaming, multi-age grouping, and individualized instruction in various content areas.

One of the dilemmas for change facilitators, researchers and evaluators is distinguishing between innovations and innovation bundles. The problem is actually more complex than that since there is actually a continuum that ranges from single component variations--to configuration components--to a particular configuration to innovation bundles. An interesting question that has to be grappled with is: When does a component variation become a component, become an innovation, become an innovation bundle? The concept of size may have something to do with answering this question.

Implications for Research and Evaluation

Innovation Configurations as a concept and technique can be used by research and evaluation staff to describe the present practice of users and non-users. It is one way of describing operationally what the treatment is. It can be used to document the existence of the treatment in the experimental group and absence of components of the treatment in the control group. The concept can be used as a dependent variable in studies that are looking at the causes of use and changes in use of a particular innovation. In other situations Innovation Configurations can serve as an independent variable when the research questions have to do with the relationships between use of the innovation and effects.

1. Innovation Configurations should be assesed in the treatment and control groups.

Contrary to past practice it is clear that use of the innovation in the treatment group and nonuse of the innovation in the control group cannot simply be assumed. How the innovation is used in each situation and whether the innovation is used at all must be assessed. Innovation Configurations provides a way to describe that use in operational terms. It is not sufficient to describe the implementation requirements, the philosophy or the goals of the innovation. For experimental and evaluation studies, it is crucial to describe operationally how the treatment has been used by each user and group of users and to document that it is absent operationally in the control settings. Without these data it is impossible to have confidence in any findings where use of the innovation or treatment is a variable.

2. Innovation Configurations can be associated with particular outcomes.

In future studies it seems important to consider the relationship between particular outcomes and particular components of innovations. It is conceivable that certain components of an innovation account for major portions of the out-

come variance, while other components may make little or no difference. This would probably vary depending upon the outcomes variables being assessed. There also may be interactions between certain components and the outcomes that are observed. Thus, multivariate analyses may be appropriate. It also may be, as generic components are identified, that particular components may be associated with significant effects across different innovations. These may be the most powerful determinants of outcomes regardless of which particular innovation they are associated with. Or they may be frequently associated with ease of implementation or low implementation of various innovations. Identification of these critical components could make a major contribution to future development efforts.

3. What are the influences that lead to changes in Innovation Configurations?

During the course of implementation, a multitude of variables may influence the user to adapt the innovation. Adaptation has emerged as not only a useful descriptor of what occurs during the change process, but also as major contribution to successful implementation. Different conceptual perspectives and terminologies have been proposed to describe an innovation as it undergoes change during implementaiton. One, of course, is that of Innovation Configurations. Rice and Rogers (1980) propose the term "re-invention." Miles and Huberman (1981) speak of "transformations."

Probably the most widely known study that has focused on adoption is that published in several volumes by the Rand Corporation (Berman & McLaughlin, 1975). The authors report on their extensive analysis of policy and practice relative to the implementation of selected federal programs. A key concept for the studies is that of mutual adaptation, which is defined as 'an organizational process in which an innovation plan is developed and modified in light of the

realities of the institutional setting, and in which the organization changes to meet the requirements of the innovative project (Greenwood, Mann & McLaughlin, 1975, p. 31). The Rand studies found such mutual adaptation to be related to successful implementation.

What causes adaptation? And what effects does adaptation of an innovation have on individual users, the context within which they work, and the clients whom they serve? These are questions for further research. It appears from several studies that change facilitators, such as the principal, can have direct influence upon the configurations of the innovation observed in each classroom. These effects include consistency and inconsistency of configurations across classrooms within a particular building or a particular school district. In addition, user needs, contextual factors and client readiness may influence the particular configurations of an innovation that are used.

Innovation Configurations provides one way to examine the causes of adaptation as it occurs across sites. Once these adaptations are described and their causes ascertained, the empirical question becomes whether the outcomes that are associated with the adapted components are changed, enhanced, or reduced as a result. Preliminary studies indicate that outcomes are indeed affected by change in configuration (Reidy & Hord, 1979).

4. What are the relationships between Levels of Use and Innovation Configurations?

The concept of Levels of Use (Hall, Loucks, Rutherford & Newlove, 1975) examines whether or not the person is using the innovation. The Levels of Use decision points emphasize the kinds of adaptations made and the motivations for making them. However, without configuration information, one doesn't know what is being used. Thus for a complete picture of use, it is useful to assess both Levels of Use and Innovation Configurations in most studies. They are orthogo-

nal concepts. An individual might be at a certain Level of Use, for example Routine Use, for any configuration of an innovation.

For full documentation of use and nonuse of an innovation in a particular study it is important to know first of all whether or not they were users (Is it being used?) and then what configuration of the innovation is being used (What is it?). Exploratory work indicates that certain configurations of an innovation may be associated with particular Levels of Use, while other configurations are found at all levels. These two dimensions together provide an accurate and concrete description of the use or nonuse of the innovation for each subject. With these data it is possible to look at the effects of a particular intervention or contextual condition on innovation use, and of a particular configuration on innovation outcomes. It helps to more clearly understand how treatments are actually delivered and what effects are associated with these different configurations of delivery.

Implications for Change Facilitators

Change facilitators are individuals who have a responsibility for facilitating the change process. These include building administrators, district administrators, curriculum specialists, staff developers, evaluators, and others who work with teachers or other front-line users. The concept of Innovation Configurations has several implications for individuals in this role.

1. A tool for describin the innovation during dissemination.

In addition to having the description of implementation requirements, philosophy, and goals of innovations, it is important in disseminating information about innovations to include descriptive information about what the innovation looks like in actual practice, that is, an Innovation Configuration description. By identifying the essential components of an innovation and accep-

table component variations, several objectives can be accomplished in a dissemination effort. First, potential adopters are able to compare descriptions of the innovation in operation with their present practice. Thus, they can identify areas where the components of the innovation most represent major changes and other areas where the adoption of the innovation will simply reinforce or complement present practice. This would result in more realistic expectations on the part of potential adopters, and in more truthful packaging of the innovation by innovation agents.

2. A framework for developing consensus about what "use" means.

In the implementation of a revised science program, district staff in Jefferson County, Colorado (Melle & Pratt, 1981) developed a twelve component checklist to represent the essential components that they felt had to be in place for use of that particular innovation. Developing this checklist and then sharing it with administrators, teachers, other change facilitators, evaluators and researchers resulted in district-wide understanding of what use of the innovation entailed, avoiding much of the usual ambiguity, uncertainty and confusion. Unfortunately, this practice does not occur frequently enough.

Typically, policy makers do not provide configuration information to adopters even when the use of the innovation is mandated. Thus, there are decrees for bilingual education, mainstreaming, busing, etc. without it being clear exactly how the innovation is to be operationalized. In some instances this backfires on early adopters. They may implement a particular configuration of the innovation and three years later, as policy makers refine their thinking about acceptable use, the early adopters find themselves "out of compliance" with their early configurations of the innovation. In addition to punishing early adopters this occurrence reinforces and rewards late adopters for delaying their decision to implement new practices.

Again, early development of a consensus about what use of the innovation entails can lead to consistency in communication, clarification of terminology and a much easier implementation effort since all would know where they are headed and have some clarity in how to approach getting there.

3. A framework for focusing the delivery of assistance to innovation users.

Assessment of Innovation Configurations could lead to particular workshops that are targeted toward particular Innovation Configuration components (Hall & Loucks, 1981). For example, if it is desirable that a particular grouping variation be used, a workshop could be developed and delivered that would provide users skill in this particular component variation. On the other hand, if all teachers were using the same component variation and more variety was desired, then set-breaking workshops could be conducted to help expand the number of configuration variations that were being used. If change facilitators were to focus on particular components, they could more effectively organize and target their interventions. For example, principals could focus classroom observations on particular components rather than attempting to look at the whole complex array of an innovation (Melle & Pratt, 1981).

4. Phasing the implementation of components may be desirable.

All too frequently, innovation implementation occurs with a "big plunge." As of some particular date all users are expected to use the entire innovation or innovation bundle. What often happens in this case, particularly with large innovations, is that the plunge literally puts everyone in over their heads. As a result they gradually build a distaste for their experiences with the innovation and withdraw from use of its major components.

With more complex and larger innovations, or ones which require a great deal of change from previous practice, a phased implementation might be more

effective. One or two innovation components might be identified for implementation during the first year, and then in subsequent years additional major components of the innovation could be implemented. This would allow limited staff development resources and user energy to be focused upon making the first components operational before they are overwhelmed with the addition of other equally complex components. This approach would acknowledge that change is a process. By phasing use of components more successful implementation efforts can be developed. This also means that the evaluators will need to acknowledge limited use during the first year, and postpone summative evaluation until implementation of all components has occurred. This idea of phasing the implementation of components also suggests that "competence" would have a different definition for first year users than it would for third year users.

In Summary

The concept of Innovation Configurations has proven very useful to staff at the Texas R&D Center and practitioner colleagues in grappling with defining different innovations and determining whether or not they are actually being used in classrooms. Clearly much definitional work is necessary to determine Innovation Configuration components and to develop component checklists. However, it results in increased clarity and specificity about what the innovation is. This can be of great utility in change process research and, as illustrated in the other papers in the symposium, can be of use to evaluators and change facilitators as they attempt to be more effective in their work.

Present research at the Texas R&D Center is looking particularly at the effects of change facilitators upon the configurations of users. Others are invited to consider the concept, to help clarify the thinking that has occurred and to make further contributions.

References

Charters, W. W., Jr., & Jones, J. E. On the risks of appraising non-events in program evaluation. Educational Researcher, 2(11), 1973, 5-7.

Evans, W. J. & Scheffler, J. W. Degree of implementation: A first approximation. Paper presented at the annual meeting of the American Educational Research Association, Chicago, April 1976.

Fullan, M. & Pomfret, A. Research on curriculum and instruction implementation. Review of Educational Research, 1977, 47(2), 335-393.

Greenwood, P. W., Mann, D., & McLaughlin, M. W. Federal programs supporting educational change, Vol. III: The process of change. Santa Monica, California: Rand Corporation, 1975.

Hall, G. E. & Loucks, S. F. A developmental model for determining whether the treatment is actually implemented. American Educational Research Journal, Summer 1977, 14(3) 263-276.

Hall, G. E. & Loucks, S. F. Innovation configurations: Analyzing the adaptations of innovations. Austin: Research and Development Center for Teacher Education, The University of Texas, 1978.

Hall, G. E. & Loucks, S. F. Program definition and adaptation: Implications for inservice. Journal of Research and Development, 1981, 14(2), 46-58.

Hall, G. E., Loucks, S. F., Rutherford, W. L. & Newlove, B. W. Levels of use of the innovation: A framework for analyzing innovation adoption. The Journal of Teacher Education, 1975, 26(1), 52-56.

Heck, S. Assessing innovation configurations: Strategies and related issues. Paper presented at the annual meeting of the American Educational Research Association in Los Angeles, April 1981.

Heck, S., Stiegelbauer, S., Hall, G. E., & Loucks, S. F. Measuring innovation configurations: Procedures and applications. Austin: Research and Development Center for Teacher Education, The University of Texas, 1981.

Leinhardt, G. Modeling and measuring educational treatment in evaluation. Review of Educational Research, Fall 1980, 50(3), 393-420.

Leithwood, K. A. & Montgomery, D. J. Evaluating program implementation. Evaluation Review, April 1980, 4(2), 193-214.

Melle, M. & Pratt, H. Documenting program adaptation in a district-wide implementation effort. Paper presented at the annual meeting of the American Educational Research Association in Los Angeles, April 1981.

Miles, M. & Huberman, M. Personal communication, 1981.

Network, Inc. A study of dissemination efforts supporting school improvement. Andover, Mass: The Network, Inc., 1981.

Owens, T. R. & Haenn, J. F. Assessing the level of implementation of new programs. Paper presented at the annual meeting of the American Educational Research Association, New York, April 1977.

Reidy, E. F. & Hord, S. M. Utilizing implementation data in the evaluation of a mathematics skills achievement monitoring program. Paper presented at the annual meeting of the American Educational Research Association in San Francisco, 1979.

Rice, R. E. & Rogers, E. M. Reinvention in the innovation process. Knowledge: Creation, Diffusion Utilization, June 1980, 1(4), 499-514.

Rogers, E. M. & Shoemaker, E. F. Communication of innovations: A cross-cultural approach. New York: Free Press, 1971.

Stallings, J. A. & Kaskowitz, P. H Follow through classroom observation evalution, 1973-73. Menlo Park, California: Stanford Research Institute, 1974.

Treadway, P. G. Functional analysis of educational programs. Paper presented at the annual meeting of the American Educational Research Association, Boston, 1980.

Trohoski, C. Application of innovation configurations to evaluation of NDN and Title IVC programs. Paper presented at the annual meeting of the American Educational Research Association in Los Angeles, April 1981.